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EXAMINER

NELSON, MICHAEL B

ART UNIT	PAPER NUMBER
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1794

NOTIFICATION DATE	DELIVERY MODE
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11/20/2008

ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No. 10/542,766	Applicant(s) KATO, EIICHI	
	Examiner MICHAEL B. NELSON	Art Unit 1794	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 September 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 7, 28 and 30-45 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7, 28 and 30-45 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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DETAILED ACTION

Response to Amendment

1. Applicant's amendments filed on 09/08/08 to the claims and specification have been entered. Claims 1-6, 10-13, 27 and 29 have been cancelled and claims 7, 28 and 30-45 are currently under consideration on the merits. The previous objections have been withdrawn as a result of applicant's amendments.

Claim Rejections - 35 USC § 103

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

3. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later

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invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 7, 28 and 30-45 are rejected under 35 U.S.C. 103(a) as being unpatentable over Matsufuji et al. (U.S. 2002/0018886), in view of Sato et al. (U.S. 2002/0147108), with evidentiary support from Chopin et al. (U.S. 6,362,121).

Regarding claim 7, Matsufuji et al. discloses an antireflection film comprising:

- a transparent support;
- a high refractive index layer comprising a matrix and fine particles of a high refractive index oxide,
- and a low refractive index layer having a refractive index of less than 1.55, in this order.

(See [0036] and Fig. 1(c). The antireflection film has a transparent support, 1, a high refractive index layer, 5, and a low refractive index layer, 3, in that order. Also see [0183], the high refractive index layer comprises a matrix and fine particles of a high refractive index oxide, (inter alia titanium oxide of a rutile structure). See [0192], the low refractive index layer is disclosed as having an index of refraction of between 1.20 and 1.55, which substantially overlaps the claimed range with both endpoints lying within the range.)

Matsufuji et al. does not disclose the particular limitations directed towards the composite particles as instantly recited.

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Sato et al. discloses a high refractive index composite oxide, wherein the fine particles of a high refractive index composite oxide are fine particles of a composite oxide containing:

(See [0023] - [0037], the general invention is for different methods of forming fine particles of composite oxides. One of which is carried out by forming an aqueous solution of one metal fluoro complex and introducing seed crystals of another metal oxide to form a composite fine particle of the two metal oxides ([0058]). Another method is for doping of the metal fluoro complex in solution with metal ions ([0062]). It is also disclosed that these methods could be combined [0066].)

- a titanium element;

(See [0043]-[0045]. Titanium is disclosed as one of the metals M, used in the aqueous metal fluoro compound.)

- and at least one metal element, in which the oxide of the at least one metal element has a refractive index of 1.95 or more,

(See [0056], the oxides used to form the composite are disclosed as being oxides of inter alia indium and tin. It is also disclosed that mixtures of two or more oxides are possible. Indium and tin are oxides having refractive indexes within the claimed range.)

- and the composite oxide is doped with at least one metal ion selected from the group consisting of Co ion, Zr ion and Al ion;

(See [0062] and [0081], cobalt, zirconium and aluminum are listed as metals for use as doping ions, with zirconium and aluminum specifically listed as being combinable with titanium oxide. Also see [0066], the processes for producing composite metal oxides are disclosed as being combinable and in example 23 ([0156]-[0158]) titanium

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oxide is doped with an ion, for which cobalt, zirconium and aluminum are listed as substitutes, and also combined with another metal oxide, for which iron oxide is listed as a substitute, to form composite metal oxide particles that are doped with metal ions.)

Furthermore, Sato et al. discloses that his invention, when used in coating layers exhibit transparency, low peeling properties and weather resistance ([0017]).

The inventions of both Matsufuji et al. and Sato et al. are drawn to the field of metal oxides for use in coatings and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the antireflective film having metal oxide particles of Matsufuji et al. by using the composite metal oxide particles as taught by Sato et al. for the purposes of imparting low peeling properties and weather resistance.

Regarding claim 37, Matsufuji et al. discloses an antireflection film comprising:

- a transparent support;
- a high refractive index layer comprising a matrix and fine particles of a high refractive index oxide,
- and a low refractive index layer having a refractive index of less than 1.55, in this order.

(See [0036] and Fig. 1(c). The antireflection film has a transparent support, 1, a high refractive index layer, 5, and a low refractive index layer, 3, in that order. Also see [0183], the high refractive index layer comprises a matrix and fine particles of a high refractive index oxide, (inter alia titanium oxide of a rutile structure). Also see [0192], the low refractive index layer is disclosed as having an index of refraction of between

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1.20 and 1.55, which substantially overlaps the claimed range with both endpoint lying with the range.)

Matsufuji et al. does not disclose the particular limitations directed towards the composite particles as instantly recited.

Sato et al. discloses a high refractive index composite oxide, wherein the fine particles of a high refractive index composite oxide are fine particles of a composite oxide containing:

(See [0023] - [0037], the general invention is for different methods of forming fine particles of composite oxides. One of which is carried out by forming an aqueous solution of one metal fluoro complex and introducing seed crystals of another metal oxide to form a composite fine particle of the two metal oxides ([0058]). Another method is for doping of the metal fluoro complex in solution with metal ions ([0062]). It is also disclosed that these methods could be combined [0066].)

- a titanium element;

(See [0043]-[0045]. Titanium is disclosed as one of the metals M, used in the aqueous metal fluoro compound.)

- and at least one metal element, in which the oxide of the at least one metal element has a refractive index of 1.95 or more,

(See Example 1, [0121]-[0124], Iron oxide and Titanium oxide are combined into a composite particles. Iron oxide has a refractive index higher than 1.95. Numerous other metals oxides are listed as combinable in the composite particles ([0060]).)

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- and the composite oxide is doped with at least one metal ion selected from the group consisting of Co ion, and Zr ion;

(See [0062] and [0081], cobalt, zirconium and aluminum are listed as metals for use as doping ions, with zirconium and aluminum specifically listed as being combinable with titanium oxide. Also see [0066], the processes for producing composite metal oxides are disclosed as being combinable and in example 23 ([0156]-[0158]) titanium oxide is doped with an ion, for which cobalt, zirconium and aluminum are listed as substitutes, and also combined with another metal oxide, for which iron oxide is listed as a substitute, to form composite metal oxide particles doped with metal ions.)

Furthermore, Sato et al. discloses that his composite metal oxide particles would be advantageous in, among other things, optical coatings as antifogging agents ([0005]).

The inventions of both Matsufuji et al. and Sato et al. are drawn to the field of metal oxides for use in coatings and therefore it would have been obvious to one having ordinary skill in the art at the time of the invention to have modified the antireflective film having metal oxide particles of Matsufuji et al. by using the composite metal oxide particles as taught by Sato et al. for the purposes of imparting antifogging properties.

Regarding the rutile structure of the TiO_2 in Matsufuji et al. as compared to the anatase TiO_2 seed particles mentioned in Sato et al., one having ordinary skill in the art would know that rutile and anatase TiO_2 are differing forms of TiO_2 found in nature and would be functional equivalents (See Matsufuji et al. [0183], showing their equivalence as alternative materials for high refractive index inorganic particles and also see Chopin et al. C2, L55-65, showing their

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equivalence as alternative materials for the TiO_2 used in the photocatalytic coatings). Hence it would have been obvious to have substituted the rutile TiO_2 in Matsufuji et al. for the anatase TiO_2 in Sato et al.

Regarding claims 28 and 39, modified Matsufuji et al. discloses all of the claimed limitations as set forth above. Additionally, Matsufuji et al. discloses an antireflection film which further comprises a hard coat layer between the transparent support and the high refractive index layer.

(See [0036] and Fig. 1(c). The antireflection film has a transparent support, 1, a hard coat layer, 2, a high refractive index layer, 5, and a low refractive index layer, 3, in that order.)

Regarding claims 30 and 38, modified Matsufuji et al. discloses all of the claimed limitations as set forth above. Additionally, Matsufuji et al. discloses an antireflective film wherein an average particle size of the fine particles of a high refractive index composite oxide is 100 nm or less.

(See [0181], the particles are disclosed as being between preferably between 10 and 100 nm in size, which falls with the claimed range with both endpoints lying within the range.)

Regarding claims 31 and 40, modified Matsufuji et al. discloses all of the claimed limitations as set forth above. Additionally, Matsufuji et al. discloses an antireflective film

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wherein the high refractive index layer includes two layers different from each other in refractive index.

(See [0173] and Fig. 1(d). In one embodiment the high refractive index layer comprises two relatively high refractive index layers (i.e. the high refractive index layer and the medium refractive index layer). The two layers have different indexes of refraction ([0039]).

Regarding claims 32 and 41, modified Matsufuji et al. discloses all of the claimed limitations as set forth above. Additionally, Matsufuji et al. discloses an antireflective film wherein the fine particles of a high refractive index composite oxide are surface-treated with at least one compound of an inorganic compound and an organic compound.

(See [0184], inorganic and organic surface treatment compounds are disclosed for use with the fine particle metal oxides in the high refractive index layer.)

Regarding claims 33 and 42, modified Matsufuji et al. discloses all of the claimed limitations as set forth above. Additionally, Matsufuji et al. discloses an antireflective film wherein the matrix contains a cured product of at least one member selected from the group consisting of an organic binder, an organometallic compound and a partial hydrolyzate thereof.

(See [0190]. The binders used as the matrix for the metal oxide particles in the high refractive index layer are polymers which are organic binders.)

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Regarding claims 34 and 43, Matsufuji et al. discloses all of the claimed limitations as set forth above. Additionally, Matsufuji et al. discloses an antireflective film wherein the high refractive index layer has a refractive index of 1.75 to 2.4.

(See [0174], the high refractive index layer is disclosed as having a refractive index of between 1.65 and 2.40 which completely overlaps the claimed range, with the upper endpoint, 2.40, lying within the claimed range.)

Regarding claims 35 and 44, Matsufuji et al. discloses all of the claimed limitations as set forth above. Additionally, Matsufuji et al. discloses an antireflective film wherein the high refractive index layer is formed from a composition obtained by dispersing particles of the high refractive index composite oxide using a dispersing agent, in which the dispersing agent is a compound having at least one anionic group selected from the group consisting of a carboxyl group, a sulfo group, a phosphono group and an oxyphosphono group.

(See [0103], Phosphonic acid group and sulfonic acid group are disclosed as products used to improve the compatibility of the inorganic fine particles in the hard coat layer with the binder resin (i.e. thereby easing dispersion ([0104])) and improving the film's resistance to cracks. Also see, [0188], various other dispersing agents are used in the high refractive index layer to disperse the metal oxide particles, of which the instant claimed dispersing agents are functional equivalents. It would have been obvious to one having ordinary skill in the arts at the time of the invention to have used the dispersing agents used for the particles in the hard coat layer as dispersing agents for the particles in

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the high refractive index layer since they were functional equivalents and in order to impart improved crack resistance.)

Regarding claims 36 and 45, Matsufuji et al. discloses all of the claimed limitations as set forth above. Additionally, Matsufuji et al. discloses an antireflective film wherein the dispersing agent is a compound containing a cross-linkable or polymerizable functional group.

(See [0103]-[0105], additional measures to improve the compatibility of the inorganic fine particles in the hard coat layer with the binder resin (i.e. thereby easing dispersion ([0104])) and improving the film's resistance to cracks are disclosed as cross linking agents, (i.e. polymerizable vinyl group), to bind the surface treated particles and the binder resin at the same time that the binder layer and the surface treatment agent are crosslinked. Also see, [0188], dispersing agents are used in the high refractive index layer to disperse the metal oxide particles. It would have been obvious to one having ordinary skill in the arts at the time of the invention to have used the polymerizable functional groups used to aid in the dispersion of the particles in the hard coat layer for the particles in the high refractive index layer since they both assist in proper dispersion and in order to impart improved crack resistance.)

Response to Arguments

6. Applicant's arguments filed on 9/08/08 are considered moot in view of the new rejections necessitated by applicant's amendments. Arguments which are still deemed to be relevant are addressed below.

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7. Regarding applicant's arguments that Matsufuji et al. does not, by itself, disclose certain aspects of the instant invention, the examiner would like to note one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

8. Regarding the arguments that Sato et al. does not disclose the added limitation of claim 7, Sato et al. does in fact disclose using metal oxides of the recited high refractive index metals (See rejection of claim 7 above). Furthermore, the general inventive concept of Sato et al. is for combining metal oxides with metals to form composite particles and therefore it would have been obvious to one having ordinary skill in the art to have used a variety of metal oxides which have different refractive indexes than TiO₂ ([0035]).

9. Regarding the arguments that Sato et al. does not disclose a rutile structured TiO₂ seed particles, Sato et al. does in fact solely disclose anatase type TiO₂ in the examples however one having ordinary skill in the art would have found it obvious to have substituted rutile TiO₂ for the anatase TiO₂ in Sato et al. because the two materials were known as equivalent functional alternative for high-refractive index materials and photocatalytic materials (See Matsufuji et al. [0183], showing their equivalence as alternative materials for high refractive index inorganic particles and also see Chopin et al. C2, L55-65, showing their equivalence as alternative materials for the TiO₂ used in the photocatalytic coatings). Furthermore, Sato et al. does not contain any disclosure which would lead one having ordinary skill in the art to think that the anatase type TiO₂ is preferred over the rutile alternative and more to the point there is no disclosure which teaches away from the use of the rutile structure as in Matsufuji et al. and

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Chopin et al. The purported benefits as cited in the remarks (i.e. suppressing photocatalytic activity) are not instantly claimed and therefore not found to be relevant because although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

Moreover, from the cited portion of the specification, it is not clear that the rutile structure results in improved weatherability. Also, the disclosure of Sato et al. shows that the particles are in fact improved in terms of weatherability ([0017]).

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL B. NELSON whose telephone number is (571) 270-3877. The examiner can normally be reached on Monday through Thursday 6AM-4:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carol Chaney can be reached on (571) 272-1284. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MN/
11/10/08

/Carol Chaney/
Supervisory Patent Examiner, Art Unit 1794